

## **REMARKS/ARGUMENTS**

Claims 1-21, 26-32, and 35-41 are pending in the application. Reconsideration of the claims in view of the following Remarks is respectfully requested.

### **35 U.S.C. § 102(b)**

Claims 1, 5, 9-13, 17, 26, 30-32, and 35-41 were rejected under 35 U.S.C. § 102(b) as anticipated by Stacey et al. (US 5175149). The Examiner stated that Stacey et al. teach applying a composition comprising a pentasaccharide having a fatty acid attached thereto to a legume plant seed.

Applicants respectfully traverse this rejection. The rejected claims recite methods comprising a treatment in the immediate vicinity of a seed, root or plant with a composition comprising at least one lipo chitooligosaccharide (LCO), or providing or incubating a bacterial strain expressing an LCO in the vicinity of a seed, root, or plant. The methods are directed to enhancing plant crop seed germination, seedling emergence or growth, or breaking the dormancy or quiescence of a plant.

Applicants respectfully submit that Stacey et al. nowhere teaches or suggests treating a seed, root, or plant with a composition comprising at least one LCO to enhance germination, emergence, or growth, or to break the dormancy or quiescence of a plant. Nor does Stacey et al. teach or suggest incubating a bacterial strain expressing an LCO in the vicinity of the seed, root, or plant, in order to enhance plant crop seed germination or seedling emergence or growth.

Rather, Stacey et al. is directed to the use of phytohormones for inducing root hair curling and nodulation in leguminous plants. This application of phytohormones is completely distinct and unrelated to the subject matter of the present invention, which relates to seed germination, seedling emergence, or plant growth. Therefore, Applicants' claims are directed to a new and different use than the cited prior art, and it is well established that new uses of known processes may be patentable. *Bristol-Myers Squibb Co. v. Ben Venue Laboratories, Inc.*, 246 F.3d 1368 (Fed. Cir. 2001).

The Examiner asserts it is inherent that application of the pentasaccharide as taught by Stacey et al. would break the dormancy of a plant. Applicants respectfully disagree. "A reference includes an inherent characteristic if that characteristic is the 'natural result' flowing from the reference's explicitly explicated limitations." *Eli Lilly & Co. v. Barr Laboratories, Inc.*, 251 F.3d 955 (Fed. Cir. 2001). "In relying upon the theory of inherency, the examiner must provide a basis in fact or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *MPEP 2112*, quoting *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in the original).

The methods taught by Stacey et al. do not inherently have the natural, necessary result of enhancing plant crop seed germination, seedling emergence, or growth, or breaking the dormancy or quiescence of a plant. This is because Stacey et al.'s methods are directed to a different use than the methods recited in the present claims, namely, the induction of root hair curling and nodulation. These processes are not directly related to the enhancement of seed germination, seed emergence, or growth. A hormone that induces root hair curling and nodulation does not *necessarily* enhance germination, emergence, or growth. At best, enhanced nodulation *may* increase nitrogen fixation, which *may* lead to enhanced growth, *if* the plant is under nitrogen-limited conditions. Furthermore, even if growth was enhanced, this growth would only occur after nodulation was completed and nitrogen fixation within the nodules began. This event occurs after the seedling stage, while the present claims recite methods involving treatment with LCO before the seedling stage. Thus, the methods taught by Stacey et al. simply do not have the results recited in the present claims. Applicants submit, therefore, that claims 1, 5, 9-13, 17, 26, 30-32, and 35-41 are patentable over Stacey et al. at least for this reason. Withdrawal of this rejection is respectfully requested.

Furthermore, claims 17-21 recite methods for breaking the dormancy or quiescence of a plant. Stacey et al., however, only discloses the use of LCO to induce root hair curling and nodulation. To already have root hairs, a seed must be actively growing and not dormant. Therefore, the methods taught by Stacey et al. only involve the use of LCO with plants that are not dormant. Consequently, the methods taught by Stacey et al. would *never* have the result of

breaking the dormancy or quiescence of a plant as is claimed. Thus, claims 17-21 are patentable over Stacey et al. for this additional reason.

**35 U.S.C. § 103(a)**

Claims 6-8 and 14-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Stacey et al. The Examiner asserted it would be obvious to determine the optimum amount of LCO to develop the most effective method for enhancing seedling emergence. Applicants respectfully traverse this rejection.

In order to establish a *prima facie* case of obviousness, the Examiner must show a) that the references disclose all of the elements of the invention, b) that there would be motivation to modify the teaching of the reference to obtain Applicants' claimed invention, and c) a reasonable expectation of success. Applicants submit that the Examiner has not established a *prima facie* case of obviousness at least because the reference does not disclose all of the elements of the claimed invention, and there is no motivation provided in the reference to modify its teachings to obtain Applicants' invention as claimed.

Claims 6-8 and 14-16 each depend from, and add additional limitations to, claim 1. As stated above, claim 1 is patentable over Stacey et al. under 35 U.S.C. § 102(b) because this reference does not teach using LCO to enhance plant crop seed germination, seedling emergence, or growth. Since the Examiner has provided no motivation to modify Stacey et al. for this use, claims 6-8 and 14-16 are also patentable over Stacey et al. under 35 U.S.C. § 103(a), at least for this reason.

Furthermore, claims 6-8 and 14-16 are directed to methods for enhancing plant crop seed germination or seedling emergence or growth using recited concentrations of LCO. Stacey et al. only teaches particular concentrations for the different use of inducing root hair curling and root nodulation. Applicants submit that one of skill in the art could not reasonably predict from reading Stacey et al. what concentrations of LCO would be effective to obtain the claimed results. Furthermore, since Stacey et al. does not teach or suggest that use of LCO can enhance germination, emergence, or growth, one of ordinary skill in the art would not be motivated to

modify Stacey et al. to obtain the claimed optimum concentrations for attaining this result. Therefore, Applicants submit that claims 6-8 and 14-16 are patentable over Stacey et al. under 35 U.S.C. § 103(a), for this additional reason.

**Claim objections**

Claims 2-4, 18-21, and 27-29 were objected to as being dependent upon a rejected base claim. These claims depend from either claim 1, 17, or 26. Since each of these claims is patentable over the cited art for the reasons stated above, Applicants submit that claims 2-4, 18-21, and 27-29 are also patentable. Withdrawal of this objection is respectfully requested.

**Summary**

Applicants submit that all claims are in condition for allowance. A speedy and favorable action on the merits is hereby solicited. If the Examiner feels that a telephone interview may be helpful in this matter, please contact Applicants' representative at (612)336-4728.

Respectfully submitted,

MERCHANT & GOULD P.C.

Dated: \_\_\_\_\_

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By: \_\_\_\_\_



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